

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Peter B. Madoff  
Serial No. : 09/392,018  
Filed : September 8, 1999  
Title : OPENING PRICE PROCESS FOR TRADING SYSTEM  
Art Unit : 2165  
Examiner : Forest Thompson Jr.

**BOX AF**

Commissioner for Patents  
Washington, D.C. 20231

BRIEF ON APPEAL

**(1) Real Party in Interest**

The real party in interest in the above application is Primex Holdings, LLC., a Limited Liability Corporation existing by virtue of laws of The State of New York.

**(2) Related Appeals and Interferences**

The appellant is not aware of any appeals or interferences related to the above-identified patent application.

**(3) Status of Claims**

This is an appeal from the decision of the Primary Examiner in an office action dated July 25, 2002 finally rejecting 1-30 and 32-34, all the claims of the above application. The Appellant claims 1-30 and 32-34 stand rejected under 35 U.S.C. 102(e) as anticipated by Rickard et al., U.S. Patent 6,016,483 and under 35 U.S.C. 103(a) as obvious over Rickard et al., U.S. Patent 6,016,483. A Notice of Appeal was mailed on November 22, 2002.

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D.C. 20231.

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January 31, 2003

Marie Collins

Marie Collins

**(4) Status of Amendments**

No response to the last final rejection was filed. All amendments have been entered.

**(5) Summary of Invention**

**Background**

In any trading system or market, there exists the possibility that the volume of buy orders will not balance the volume of sell orders at the opening of trading. This could occur for many reasons or for no apparent reason. For example, events may trigger buying or selling pressure in a particular security or the market in general. Also simple fluctuations in supply/demand could produce an imbalance at the opening.

**Appellant's Invention**

Appellants' invention is directed to techniques for determining an opening price for a product traded in a trading system. A feature of the invention includes dissemination of an allocation message to market maker participants to communicate an expected allocation of the imbalance for execution at an initial opening of the market in the event that the imbalance exists at the opening. Another feature of the invention includes the allocation message in conjunction with dissemination of a market imbalance message to the public.

In one aspect orders are received for the product. The orders specify a quantity and whether the order is a buy or sell order. The invention determines if an imbalance condition exists between received buy orders and received sell orders. If an imbalance exists the invention posts an allocation message to market maker participants to communicate an expected allocation of the imbalance for execution at an initial opening of the market in the event that the imbalance exists at the opening.

An additional aspect of the invention includes receiving orders that specify a quantity and whether the order is a buy or sell order. The method also includes determining if an imbalance condition exists between received buy orders and received sell orders. Over a first plurality of intervals of time prior to a market opening, the method posts a first corresponding plurality of allocation messages to market maker participants to communicate the market maker participants' expected allocations of the imbalance for execution by the market maker participants at the

opening of the market on the side of the imbalance in the event that the imbalance exists at the opening. Over a second plurality of intervals of time prior to the market opening, the method disseminates a second corresponding plurality of market imbalance messages to the public.

The opening price techniques provide more transparency to the forces that impact price at the opening by disseminating Imbalance Messages and Anticipated Share Allocation Messages to the public and market participants, respectively. These messages assist in reducing excess volatility, helping to bring the market to an equilibrium price more smoothly as a market opening approaches. The process expands the liquidity pool by drawing on different sources of available capital, which include orders as well as capital that dealers in the market are willing to provide.

Several techniques are disclosed for determining the actual opening price. The price itself can be based on the opening bid quote or ask quote on the side of the imbalance that is published in the market, or alternatively, at the midpoint of the opening bid quote or ask quote. The process provides several advantages for investors and other participants. It results in a single price for all who participate at the open and the price that is provided is more rationally related to market forces that may exist at that point in time. The process provides an efficient mechanism for bringing together buyers and sellers. The process removes currently existing execution price variations owing to where and when orders are sent while it mutualizes any imbalances amongst various market makers.

#### References To The Specification

FIG. 1 shows a networked auction system 10 to facilitate trading of products such as real property, personal property, and financial property such as equity securities and/or other financial instruments such as bonds, options, futures, and so forth is shown. This is but one potential application of an opening price process. (*Appellants' specification page 4 lines 2-10*).

FIGS. 3A-3B show an opening price process 200. The opening price process 200 receives market orders 202 and determines 204 from the received market orders whether there is an imbalance. Using the example system of FIG. 1, prior to the auction open, the auction system 20 receives market orders only from auction market makers and crowd participants that are entering their respective customer orders including customer orders for another broker/dealer acting as an agent. As these orders are received 202, the process determines whether there is an

imbalance between the two sides of the orders, i.e., buy orders vs. sell orders. If an imbalance exists, the existence of this imbalance is disseminated 206 to all auction participants and the public generally, via an "Imbalance Message." The Imbalance Message includes the size of the total imbalance for a security at that time. (*Appellants' specification page 10 line 22 to page 11 line 10*).

After any imbalance has been determined 204, the opening price process 200 determines 208 an anticipated share allocation and transmits 210 a "Anticipated Share Allocation Message" (ASAM) to each one of the market makers. Each market maker receives its own different ASAM. The anticipated share allocation represents a quantity of shares that a particular market maker may expect to be allocated for execution at the opening of the auction process 20. The number of shares is based on the size of the imbalance that exists at the time the "Anticipated Share Allocation Message" is sent. The share allocation is derived by dividing the imbalance that exists at that point on a pro-rata basis based on each market maker's gross contribution, that is, both buy and sell sides of the market, as a percentage of the sum of the gross contributions of all market makers at the opening. (*Appellants' specification page 11 line 20 to page 12 line 2*).

The opening price process 200 issues "Imbalance Messages" and "Anticipated Share Allocation Messages" that assist in reducing potential for excess volatility. These messages can help bring a market to an equilibrium price by drawing in contra-side interest as the opening approaches. (*Appellants' specification page 121 lines 7-10*).

The opening price determining process 200 can periodically determine a share imbalance based on received market orders and likewise determine an anticipated share allocation for each individual market maker at various points in time prior to the opening. A preferred chronology of events is shown in FIG. 6. At some point in time just prior to the opening of the auction market, the process 200 will determine 212 whether a lock-in period has expired. Up to the expiration of a lock-in period, market makers may choose to lock in their last received anticipated share allocation amount, communicated via the "Anticipated Share Allocation Messages," to insure that the amount will not be further reduced. If a market maker does not lock-in the anticipated share allocation amount, the market maker can still be obliged to fill the allocation if no contra-side interest is generated to reduce the order imbalance. The actual share allocation that is locked in is the amount calculated at the end of the lock-in period, which should

correspond, as closely as possible, to the ASAM generated contemporaneous with the closing of the lock-in period. (*Appellants' specification page 12 lines 11-29*).

Subsequent to the expiration of the lock-in period, the opening price process 200 may accept 216 additional orders. The order acceptance process 216 reduces or eliminates any imbalance that may exist just prior to the opening of the auction. The opening price process 200 determines the opening price 226 based on the opening quotes in the market and whether the imbalance was eliminated. In the case that the imbalance was reduced to zero, the price for all securities is a single price which is at the midpoint of the opening quote, i.e., the opening NBBO, which represents the highest bid and lowest offer that is not locked or closed (the "first free opening quote"). (*Appellants' specification page 12 line 30 to page 13 line 30*).

If the imbalance is not eliminated, as determined at 220, just prior to the market open, embodiments of the opening price process 200 that include predefined relative indications, apply 230 any predefined relative indications that reduce or eliminate the imbalance. The predefined relative indications are priced at the NBBO plus a price improvement value. For the purposes of the opening, however, the predefined relative indications are treated as market orders on the side that would reduce the imbalance and the specified relative price, e.g., NBBO + pi (price improvement) does not impact the price at the opening or the price at which the predefined relative indication is fulfilled. (*Appellants' specification page 13 line 21 to page 14 line 2*).

#### **(6) Issues**

The issues to be decided on appeal are:

Did the Examiner properly reject claims 1, 11, 21 and 32 under 35 U.S.C. 112, second paragraph as being incomplete for omitting essential steps.

Did the Examiner properly reject claims 1-32 and 34-35 under 35 U.S.C. 102(b), as being anticipated by Rickard U. S. Patent No. 6,016,483 and under 35 U.S.C. 103(a) as obvious over Rickard U. S. Patent No. 6,016,483?

#### **(7) Grouping of Claims**

Claims 1-30, 32-34 do not stand or fall together. Claims 1-30, 32-34 will be argued in individually groups as at set out below.

**(8) Argument**

The Examiner is incorrect in rejecting claims 1, 11, 21 and 32 under 35 U.S.C. 112 second paragraph as being incomplete.

The Examiner has failed to establish a case of prima facie anticipation under 35 U.S.C. 102(b) of claims 1-5, 10-15 and 18-30, as being anticipated by Rickard et al., U.S. Patent No. 6,016,483.

The Examiner also failed to establish a case of prima facie obviousness under 35 U.S.C. 103(a) of claims 6-9, 16-17 and 32-24, as being obvious over Rickard et al., U.S. Patent No. 6,016,483.

Law

Incompleteness

It is not necessary for the claims to recite every element needed for practical utilization of the claimed subject matter in order for a claim to be proper under 35 U.S.C. §112, second paragraph, *Bendix Corp. v. United States*, 600 F.2d 1364, 1369, 204 U.S.P.Q. 617, 621 (Court of Claims, 1979). It is not the role of the claims to enable one skilled in the art to reproduce the invention, but rather to define the legal metes and bounds of the invention. *In re Geoffe*, 526 F.2d 1393, 1397, 188 U.S.P.Q. 131, (CCPA, 1975). The claims need not provide all operating details but a method claim should recite a positive step. *In re Erlich*, 3 U.S.P.Q. 2d 1011 (Bd. Pat. App. & Int., 1986)

Anticipation

A claim is "anticipated," when a single prior art reference discloses all features spelled out in the claim, either explicitly or inherently. *Tyler Refrigeration v. Kysor Indus. Corp.*, 777 F.2d 687, 689 (Fed. Cir. 1985); *Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991); *Glaverbel Societe Anonyme v. Northlake Marketing & Supply, Inc.*, 45 F.3d 1550 (Fed. Cir. 1995).

"It is well settled that anticipation under 35 U.S.C. 102 requires the presence in a single reference of all of the elements of a claimed invention." *Ex parte Chopra*, 229 U.S.P.Q. 230, 231 (BPA&I 1985) and cases cited.

"Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim." *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 198 (Fed. Cir. 1983).

"This court has repeatedly stated that the defense of lack of novelty (i.e., 'anticipation') can only be established by a single prior art reference which discloses each and every element of the claimed invention." *Structural Rubber Prod. Co. v. Park Rubber Co.*, 223 U.S.P.Q. 1264, 1270 (Fed. Cir. 1984), citing five prior Federal Circuit decisions since 1983 including *Connell*.

In a later analogous case the Court of Appeals for the Federal Circuit again applied this rule in reversing a denial of a motion for judgment n.o.v. after a jury finding that claims were anticipated. *Jamesbury Corp. v. Litton Industrial Prod., Inc.*, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

After quoting from *Connell*, "Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim," 225 U.S.P.Q. at 256, the court observed that the patentee accomplished a constant tight contact in a ball valve by a lip on the seal or ring which interferes with the placement of the ball. The lip protruded into the area where the ball will be placed and was thus deflected after the ball was assembled into the valve. Because of this constant pressure, the patented valve was described as providing a particularly good seal when regulating a low pressure stream. The court quoted with approval from a 1967 Court of Claims decision adopting the opinion of then Commissioner and later Judge Donald E. Lane:

[T]he term "engaging the ball" recited in claims 7 and 8 means that the lip contacts the ball with sufficient force to provide a fluid tight seal \*\*\*\* The Saunders flange or lip only sealingly engages the ball 1 on the upstream side when the fluid pressure forces the lip against the ball and never sealingly engages the ball on the downstream side because there is no fluid pressure there to force the lip against the ball. The Saunders sealing ring provides a compression type of seal which depends upon the ball pressing into the material of the ring. \*\*\* The seal of Saunders depends primarily on the contact between the ball and the body of the sealing ring, and the flange or lip sealingly contacts the ball on the

upstream side when the fluid pressure increases. 225 U.S.P.Q. at 258.

Relying on Jamesbury, the ITC said, "Anticipation requires looking at a reference, and comparing the disclosure of the reference with the claims of the patent in suit. A claimed device is anticipated if a single prior art reference discloses all the elements of the claimed invention as arranged in the claim." *In re Certain Floppy Disk Drives and Components Thereof*, 227 U.S.P.Q. 982, 985 (U.S. ITC 1985).

#### Obviousness

"It is well established that the burden is on the PTO to establish a prima facie showing of obviousness, *In re Fritsch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (C.C.P.A., 1972)."

"It is well established that there must be some logical reason apparent from the evidence or record to justify combination or modification of references. *In re Regal*, 526 F.2d 1399 188, U.S.P.Q.2d 136 (C.C.P.A. 1975). In addition, even if all of the elements of claims are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill in the art would have been prompted to combine the teachings of the references to arrive at the claimed invention. *Id.* Even if the cited references show the various elements suggested by the Examiner in order to support a conclusion that it would have been obvious to combine the cited references, the references must either expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why one skilled in the art would have found the claimed invention obvious in light of the teachings of the references. *Ex Parte Clapp*, 227 U.S.P.Q.2d 972, 973 (Board. Pat. App. & Inf. 1985)."

"The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, "[t]he mere fact that the prior art could



be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Laskowski, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).

"The claimed invention must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick, 221 U.S.P.Q. 481, 488 (Fed. Cir. 1984).

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. ACS Hospital Systems, Inc. v. Montefiore Hospital, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (emphasis in original, footnotes omitted).

"The critical inquiry is whether 'there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" Fromson v. Advance Offset Plate, Inc., 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985).

### Discussion

#### Incompleteness

Appellants' claims 1, 11, 21 and 32 are proper under 35 U.S.C. 112, second paragraph. The claims recite the elements necessary to distinguish Appellants' invention from the prior art. All that 35 U.S.C. 112, second paragraph requires is that the claims particularly point out and distinctly claim the subject matter that Appellants' regard as their invention.

There is no need for Appellants to recite a positive step of determining an opening price for a product. Although Appellants' preambles recite a method for determining an opening price for a product, it is not necessary to actually recite that step in the body of the claim. The thrust of Appellants' invention is the manner in which trading interest is attracted to handle imbalances to enable an opening price to be arrived at upon opening of a market. Appellants' invention accomplishes this by the recited elements of the claims. The actual manner in which the price value is determined can vary as Appellants described in the specification. To require Appellants to recite how the price is determine or that the price is determined would only force Appellants

to narrow the scope of the claims without the citation of prior art compelling such a narrowing of claim scope.

The purpose of the claims is to define the legal description of the invention, not to enable one of skill in the art to reproduce the invention. *In re Geoffe*. Accordingly, Claims 1, 11, 21, and 32 define the legal metes and bounds of what Appellants consider to be their invention and thus these claims are proper under 35 U.S.C. 112, second paragraph.

#### Rejections based on prior art

The Examiner has failed to apprise Appellant of the basis for any of the prior art rejections in the final office action. The Examiner merely quotes Appellants' claims and quotes passages from Rickard. The Examiner does not provide any analysis and does not explained how any teaching of Rickard corresponds to the claimed elements. This is particularly onerous on Appellant when the Examiner cites passages of Rickard as being relevant to the claim elements when in fact the passages have nothing at all to do with the subject matter claimed. For instance, the Examiner cites passages concerning option variables delta, gamma, rho, etc., as relevant to trading interest. This despite the fact that the reference itself uses those terms correctly as option variables that are used to manage risk and not as trading interest.

#### Claims 1, 2, 4, 10-12, 14, 21, 22, 24 and 25

Appellant' claim 1 is representative of this group of claims. Claim 1 is directed to a method of determining an opening price for a product traded in a trading system.

According to claim 1 the method includes determining an imbalance condition between received buy orders and received sell orders for the product and posting an allocation message to market maker participants to communicate the market maker participants' expected allocations of the imbalance for execution by the market maker participants at an initial opening of the market on the side of the imbalance in the event that the imbalance exists at the opening.

The examiner considers Rickard as disclosing the action of posting an allocation message to market maker participants at Col. 6 line 46 to Col. 7 line 47; Col. 10 lines 40-54; Col. 11 lines 19-25.

There is no mention of any messages in Rickard. Rickard mentions "output" at Col. 7 lines 14-17. There Rickard mentions output after the initial market opening. At Column 7 lines 14-18 Rickard states: "The opening prices and corresponding volatilities, once determined by the present invention, can be output to market makers (and, if seen as desirable, to other interested parties) so as to assist market makers to determine their *post-opening* desired target position." (Emphasis added)

According to Rickard the output is optional (i.e., can), and it is the actual opening price (as opposed to an allocation share of an expected imbalance as recited in claim 1) and is intended to assist in determining post-opening desired target positions (rather than encourage more interest in the market before the opening). Hence, the output of Rickard is not communicating expected allocations of the imbalance at an initial opening of the market in the event that the imbalance exists at the opening because the messages are sent after the opening prices and corresponding volatilities are determined. The messages are not directed to increase liquidity in the market by encouraging market makers or equivalents to commit capital. Nor does Rickard's after the fact output help market makers or equivalents to manage risk prior to opening execution. As set out by Appellants at page 17 lines 10-13 of the specification, market makers can use the ASAM (anticipated share allocation message) to manage risk, adjust quotations and help maintain an orderly market and thus help the market find an equilibrium at the opening. None of these features are provided by the "after the fact message" that is disclosed in Rickard.

Rickard is directed to a technique to minimize volatility in option markets. Rickard assigns a residual balance of any imbalance of orders to market makers based on an algorithm that minimizes a cumulative measure of deviation between post-opening target and current positions. Nowhere in Rickard is expressed the teachings of posting an allocation message to market maker participants to communicate an expected allocation of the imbalance for execution at an initial opening in the event that the imbalance exists at the opening. Rickard merely assigns an allocation based on an algorithm, whereas claim 1 calls for posting a message that indicates an expected allocation to communication an expected allocation if the market opens with an imbalance.

Thus, the subject matter of claim 1 and the claims in this group are not anticipated under 35 U.S.C. 102 since Rickard does not possess all of the elements of the claimed invention.

Claims 3, 13, 23 and 26-31

This claim group deals with the feature of a second message. Claim 3, which is representative of the group adds a further distinguishing limitation of disseminating a message that indicates a current imbalance between buy and sell orders for the product. Although, the Examiner cites the same passages as in the rejection of claim 1 and adds a cite to the passage at Col. 1 lines 25-42, a message is not described in Rickard. Rather, at Col. 7 lines 14-17 Rickard mentions outputting opening prices and corresponding volatilities after the initial market opening. However, this is the same output that the Examiner relies upon to anticipate the element of posting an allocation message in claim 1. Clearly, to support a rejection that claim 3 is anticipated, Rickard must have at least two different messages or outputs to the market with one message concerning an anticipated allocation and the other indicating a current imbalance. Neither of these messages nor outputs is described in Rickard.

In Col. 1 lines 25-42 Rickard recites:

There are presently five equity options exchanges in the United States and approximately fifty exchanges that trade in options throughout the world. Options are traded on a number of financial instruments, such as, for example, stocks, currencies, Treasury instruments, interest rates, market indices, commodities and the like.

When an options exchange opens trading each morning, or reopens trading after a trading halt in the underlying instrument during the trading day, the exchange conducts an opening "rotation" procedure to determine the opening price for each option. The opening rotation may take upwards of 45 minutes, during which time the price of the underlying instrument may change dramatically. Presently, the opening rotation consumes a significant portion of the trading day. Additionally, present methods used by options exchanges to allocate the residual imbalance in public orders to market makers at the opening often results in undesirable and inefficient allocations.

No mention is made of any output or message in this cited text. Hence, this group of claims is distinguished from Rickard.

Claims 5, 15

This claim group deals with the feature of periodically disseminating a public message and periodically determining an imbalance condition and posting the allocation message. Claim 5, which is representative of the group adds further distinguishing limitations of periodically disseminating a public message that indicates a current imbalance between buy and sell orders for the product to encourage contra-side interest to be drawn into the market to reduce volatility and bring the opening to an equilibrium price and periodically determining an imbalance condition and posting the allocation message to market participants over regular periods of time that occur between the initial reception of orders and actual opening of the trading system to allow market participants to adjust their positions in the product.

The Examiner cites the same passages as in the rejections above and adds a citation to the Abstract. Again, the only outputs described in Rickard are at Col. 7 lines 14-17 and as Appellants have shown those teachings are insufficient to support an anticipation rejection. However, claim 5 adds limitations of periodically disseminating a public message that indicates a current imbalance and periodically determining an imbalance condition and posting the allocation message. Rickard fails to mention periodically outputting anything to the market. Moreover, all that Rickard teaches is to optionally output opening prices and corresponding volatilities for determining post opening target positions. Clearly, to support a rejection that claim 5 is anticipated, Rickard must have at least two different messages or outputs that are periodically sent to the market with one message concerning an anticipated allocation and the other being a public message indicating a current imbalance. Neither these messages nor periodically sending of the messages are described in Rickard.

Obviousness

Claims 6, 16

This claim group deals with the feature of establishing a lock-in period. Claim 6, which is representative of this group, adds further distinguishing limitations of establishing a lock-in period that requires market makers to specify whether they accept the last anticipated share allocation received by them in order that their allocation will not be further reduced.

Rickard cannot support an obviousness rejection of these claims since, Rickard only teaches to optionally output opening prices and corresponding volatilities for determining post opening target positions. Rickard fails to suggest establishing a lock-in period that requires market makers to specify whether they accept the last anticipated share allocation. The Examiner readily admits this and relies on Official Notice that establishing a "lock-in period" is old and well known.

Appellants do not claim "lock-in periods" alone. Appellants contend that establishing a lock-in period that requires market makers to specify whether they accept the last anticipated share allocation received by them in order that their allocation will not be further reduced is new and non-obvious over the combination of Rickard and Official Notice since the base reference Rickard is silent on the limiting features of the lock in period and clearly the Examiner cannot take official notice of that which the Examiner has been unable to find in the primary reference or the other cited art, anticipated share allocation messages. Hence, Rickard and Official Notice cannot render obvious a claim that calls for an anticipated allocation that is locked in by the market maker.

Claim 7, 8, 17 and 18

Claim 17 is representative of this group and adds the limitation of instructions to apply received predefined relative indications to an imbalance that exists subsequent to establishing the lock-in period. Rickard does not suggest a predefined relative indication.

The examiner relies on Col. 7 lines 27-33 as teaching predefined relative indications. At that text Rickard states:

At the second stage, each market maker supplies as input his or her current delta and gamma positions prior to the opening and his or her desired delta and gamma positions after the opening. (If required, other measures, such as theta, rho and vega, also could be included as target variables.) Public orders are allocated to market makers according to the solution to this second optimization problem.

Predefined relative indications (or anything remotely related thereto) are not suggested or described by this passage or elsewhere in Rickard. All that are mentioned are public orders and

option variables. However, mere orders as used by Appellants are not predefined relative indications, and option variables have nothing at all to do with trading interest whether orders or predefined relative indications. Rickard defines option variables in Col. 3 lines 51-65:

Theoretical option pricing models produce values that reflect an option's sensitivity to changes in one of the five quantifiable factors. These sensitivities are assigned Greek names, such as delta, gamma, theta, rho and vega. Delta is a measure of the rate of change in an option's theoretical value for a one-unit change in the price of the underlying security. Thus, delta is the theoretical amount by which the option price can be expected to change for a small change in the price of the underlying. As such, it provides a local measure of the equivalent position risk of an option position with respect to a position in the underlying security. Delta may be expressed as a percentage, e.g. 63% (or simply "63" with the percentage symbol implied.) Every option contract has its own unique theoretical delta determined by the five quantifiable factors described above.

As stated by Appellants in the specification, a predefined relative indication corresponds to a willingness to trade (*Appellants' specification page 6 line 15*) and uses the NBBO and a price improvement "pi" to produce relative prices. The predefined relative indication enables an order to achieve the best price in the market at the current time. The provision of the price improvement relative to the NBBO or other standard market quote would tend to improve the execution price relative to the spread, i.e., the difference between bid and offer prices for any product or security. The predefined relative indication also facilitates decimal denominated trading by enabling small price improvements of one (1) cent or even less. (*Appellants' specification page 7 line 28 to page 8 line 12*).

Clearly the option variables are not trading interest and are certainly not predefined relative indications. Hence, Rickard does not anticipate or render obvious claim 17.

#### Claim 9

Claim 9 is directed to the feature of determining an opening price based on allocated imbalance amongst the market participants and applied predefined relative indications. Rickard

does not allocate imbalance and does not apply predefined relative indications to reduce the imbalance. Hence, claim 9 is neither obvious nor anticipated by Rickard.

#### Claim 19

Claim 19 is a specific way to determine an opening price. The technique is based on the first free and open bid-ask quote published by the market using the opening process and whether there is still an imbalance. Rickard neither describes nor suggests these features. Hence, claim 9 is neither obvious nor anticipated by Rickard.

#### Claim 20

Claim 20 is directed to how trading interest is executed at the opening. It calls for the entire amount of accumulated shares to be executed as a single block at one price. The Examiner cites Rickard at Col. 9 line 33-36 as teaching this limitation. However, all that Rickard teaches there is to allow each series of an option to open independently using a single price call. That is not what is recited in claim 20.

#### Claims 32-34

Claim 32 is representative of this group of claims. Claim 32 is directed to a method of determining an opening price for a product. The method includes determining an imbalance condition. It includes the additional feature of periodically posting messages. Thus, in claim 32 over a first plurality of intervals of time prior to a market opening, claim 32 requires posting a first corresponding plurality of allocation messages to market maker participants. These messages communicate the market maker participants' expected allocations of the imbalance for execution by the market maker participants at the opening of the market on the side of the imbalance in the event that the imbalance exists at the opening. Claim 32 also features a second message that is disseminated over a second plurality of intervals of time prior to the market opening. This message disseminates market imbalances to the public.

The Examiner relies on the same teachings as in rejections of claim 3. Here the Examiner provides some reasoning. The Examiner interprets the disclosures of opening rotation, round robin, and output of volatilities along with the other passages as corresponding to over a



first plurality of intervals of time prior to a market opening, posting a first corresponding plurality of allocation messages...; and over a second plurality of intervals of time prior to the market opening, disseminating a second corresponding plurality of market imbalance messages to the public. The Examiner appears to equate the values of delta and gamma to trading position. This is incorrect as noted above. Again, there is no suggest in Rickard of periodically posting allocation messages and disseminating market imbalances.

Applicant : Peter B. Madoff  
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### CONCLUSION

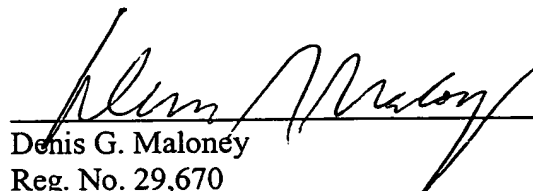
Appellant submits, therefore, that claims 1-30 and 32-34 are allowable over Rickard and are proper under 35 U.S.C. 112, second paragraph, and that the Examiner erred in rejecting Appellant's claims and should be reversed.

The brief fee of \$320 is enclosed. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: \_\_\_\_\_

1/31/03

  
\_\_\_\_\_  
Denis G. Maloney  
Reg. No. 29,670

Fish & Richardson P.C.  
225 Franklin Street  
Boston, Massachusetts 02110-2804  
Telephone: (617) 542-5070  
Facsimile: (617) 542-8906

### **Appendix of Claims**

1. A method of determining an opening price for a product traded in a trading system, the method executed over a distributed network computer system, said method comprising:
  - receiving orders from customers for the product, the orders specifying a quantity and whether the order is a buy or sell order;
  - determining an imbalance condition between received buy orders and received sell orders for the product; and
  - posting an allocation message to market maker participants to communicate the market maker participants' expected allocations of the imbalance for execution by the market maker participants at an initial opening of the market on the side of the imbalance in the event that the imbalance exists at the opening.
2. The method of claim 1 wherein the orders are orders at a market price and are orders for customer accounts.
3. The method of claim 1 further comprising:
  - disseminating a message that indicates a current imbalance between buy and sell orders for the product.
4. The method of claim 1 wherein the products are financial instruments.
5. The method of claim 1 further comprising:
  - periodically disseminating a public message that indicates a current imbalance between buy and sell orders for the product to encourage contra-side interest to be drawn into the market to reduce volatility and bring the opening to an equilibrium price; and
  - periodically determining an imbalance condition and posting the allocation message to market participants over regular periods of time that occur between the initial reception of orders and actual opening of the trading system to allow market participants to adjust their positions in the product.

6. The method of claim 5 further comprising:  
establishing a lock-in period that requires market makers to specify whether they accept the last anticipated share allocation received by them in order that their allocation will not be further reduced.
7. The method of claim 6 further comprising:  
applying received predefined relative indications, which express a willingness to trade and that reside in the system and remain dormant and unknown by other participants until executed, to an imbalance that exists subsequent to establishing the lock-in period.
8. The method of claim 7 further comprising:  
allocating the remaining imbalance amongst market makers after applying predefined relative indications to eliminate the imbalance.
9. The method of claim 8 further comprising:  
determining an opening price based on allocated imbalance amongst the market participants and applied predefined relative indications.
10. The method of claim 1 wherein the orders are limit orders and wherein marketable ones of those limit orders are applied to reduce an imbalance.
11. A computer program product for determining an opening price for a product said computer program product residing on a computer readable medium comprising instructions for causing a computer to:  
receive orders for a product, each order specifying a quantity and whether the order is a buy or sell order at a market price;  
determine an imbalance condition between received buy orders and received sell orders;  
and

post an allocation message to market maker participants to communicate a market maker participants' expected allocations of an imbalance for execution by the market maker participant at an initial opening of the market in the event that the imbalance exists at the opening.

12. The computer program product of claim 11 wherein instructions that cause the computer to accept orders, further comprise instructions that cause the computer to:

accept customer orders or orders for customer accounts.

13. The computer program product of claim 11 further comprising instructions that cause the computer to:

disseminate a message that indicates a current imbalance between buy and sell orders for the product.

14. The computer program product of claim 11 wherein the products are financial instruments.

15. The computer program product of claim 11 further comprising instructions that cause the computer to:

disseminate a message that indicates a current imbalance between buy and sell orders for the product, and wherein instructions to determine an imbalance condition, post an allocation message to market participants, and disseminate an imbalance message, occur over regular periods of time between the initial reception of orders and actual opening of the auction.

16. The computer program product of claim 15 further comprising instructions that cause the computer to:

establish a lock-in period that requires market makers to specify whether they accept the last anticipated share allocation in order that their allocation will not be further reduced.

17. The computer program product of claim 16 further comprising instructions that cause the computer to:

apply received predefined relative indications to any imbalance that may exist subsequent to establishing the lock-in period.

18. The computer program product of claim 11 further comprising instructions that cause the computer to:

accept limit orders; and

allocate the remaining imbalance amongst market makers after applying predefined relative indications and marketable limit orders to eliminate the imbalance.

19. The computer program product of claim 18 further comprising instructions that cause the computer to:

determine an opening price based on first free and open quote and whether there is still an imbalance.

20. The computer program product of claim 11 further comprising instructions that cause the computer to:

execute the entire amount of accumulated shares as a single block at one price.

21. A system for determining an opening price for products traded over a distributed, networked computer system, said system comprising:

a plurality of workstations for entering orders for financial products into the distributed, networked computer system, said orders specifying a quantity of the financial product;

a server computer coupled to the workstations for entering the orders, said server computer executing a server process that determines an opening price for the product, the server process comprising instructions that cause the server to:

receive orders for the product, each order specifying a quantity and whether the order is a buy or sell order at a market price;

determine an imbalance condition between received buy orders and received sell orders;

and

post an allocation message to market maker participants to communicate a market maker participants' expected allocations of the imbalance for execution by the market maker participants at an initial opening of the market in the event that the imbalance exists at the opening.

22. The system of claim 21 wherein the computer program product further comprises instructions for causing the server to:

receive limit orders for the product, each order specifying a quantity and whether the order is a buy or sell order.

23. The system of claim 21 wherein the computer program product further comprises instructions that cause the computer to:

disseminate a message that indicates a current imbalance between buy and sell orders for the product.

24. The system of claim 21 wherein the products are financial instruments.

25. The system of claim 22 wherein the computer program product of claim 21 further comprising instructions that cause the computer to:

apply marketable limit orders to any imbalance that may exist.

26. The method of claim 3 wherein disseminating a message that indicates a current imbalance between buy and sell orders for the product is a publicly disseminated message.

27. The method of claim 5 wherein disseminating a message that indicates a current imbalance between buy and sell orders for the product is a publicly disseminated message that is disseminated to the general public.

28. The computer program product of claim 13 wherein instructions to disseminate a message that indicates a current imbalance between buy and sell orders for the product is a publicly disseminated message.

29. The computer program product of claim 15 wherein instructions to disseminate a message that indicates a current imbalance between buy and sell orders for the product disseminate a message to the general public and market participants.

30. The system of claim 23 wherein the message that indicates a current imbalance between buy and sell orders for the product is a publicly disseminated message.

31. The system of claim 23 wherein the message that indicates a current imbalance between buy and sell orders for the product is disseminated to the general public and market participants.

32. A method of determining an opening price for a product traded in a trading system, the method executed over a distributed network computer system, said method comprising:  
receiving orders from customers for the product, the orders specifying a quantity and whether the order is a buy or sell order;  
determining an imbalance condition between received buy orders and received sell orders for the product;  
over a first plurality of intervals of time prior to a market opening, posting a first corresponding plurality of allocation messages to market maker participants to communicate the market maker participants' expected allocations of the imbalance for execution by the market maker participants at the opening of the market on the side of the imbalance in the event that the imbalance exists at the opening; and  
over a second plurality of intervals of time prior to the market opening, disseminating a second corresponding plurality of market imbalance messages to the public.

33. The method of claim 32, wherein an interval of time between each allocation message decreases as the time to the opening decreases.



Applicant : Peter B. Madoff  
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34. The method of claim 32, wherein an interval of time between each market imbalance message to the public decreases as the time to the opening decreases.